REMARKS

Claims 2, 5, and 8 are currently amended, and upon entry of this amendment, Claims 2-16 are pending. No new matter is introduced by the amendments, and a new search is not required. Applicant respectfully requests reconsideration based on the amendments and following remarks.

Claims 2, 4, 8, 9 and 13 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,945,256 to *Kim et al.* (hereinafter *Kim '256*) in view of U.S. Patent No. 6,504,581 to *Hirosue et al.* (hereinafter *Hirosue*). Applicants respectfully traverse this rejection in its entirety.

While Applicants agree with the Examiner that *Kim '256* does not disclose the step of determining positions of the light-exposed/blocked areas based on a random number, further details in the cited disclosure will show how the teachings of *Kim '256* are not compatible with random placement as claimed. *Kim '256* discloses a manufacturing method where the boundary region 130 of the first and second exposure regions 11 and 12 having a first portion and a second portion where the boundary between the first and second portions "is not linear and saw-shaped" (*sic. Kim '256* col. 4 lines 34-37), the first and second portions may have "arbitrary shapes" (*Kim '256* col. 4 lines 43-44), and the first and second portions are represented as white and gray rectangles that are "mixed with each other" (*Kim '256* col. 4 lines 64-67) where "the ratio of the areas of the white part and the gray part in every rectangle in a column is the same" (emphasis added *Kim '256* col. 5 lines 3-6). Specifically, Applicants note the disclosed ratio is 0:10, 1:9, 2:8, ..., 9:1, and 10:0 which changes consistently in one-unit increments from left-to-right (*Kim '256* col. 4 lines 62-64 and Fig. 5). Therefore, it is clear that while *Kim '256* teaches a "mixed" location, the enforced ratio means the placement is not random, and certainly cannot be considered random in the sense that a position is assigned based on a random number provided by a random number generator. Further,

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Applicants respectfully submit that *Kim '256* actually teaches away from a random placement due to the enforced ratio discussed above.

Applicants acknowledge that the four-parameter placement (four combinations of shots) disclosed by *Hirosue* includes a component relating to a random number (*Hirosue* col. 4 lines 60-67, col. 7 line 65-col. 8 line 15, Fig. 2(b) ,and Fig. 8), but respectfully assert that the type of placement disclosed is not combinable with the teachings of *Kim '256*, and that even if combined as suggested does not yield the presently claimed invention. Even if it is assumed for the sake of argument that *Hirosue* discloses a random placement for only two shots overlapping in two adjacent areas, *Hirosue* teaches the number of regions associated with a particular shot (1-4) are <u>unequal</u> (showing 12 or 16 regions per 28 possible) and therefore cannot teach a randomly placed shot "each of the positions ... being opposite to those in the first shot", as presently claimed, which requires an equal number of regions assigned to a first shot and a corresponding second shot (*Hirosue* Figs. 5-7). *Hirosue* further elaborates that "the overlapped areas may be arranged by using random numbers so that the number of pixels to be selected varies in accordance with the distance from each shot and the quadruple overlapped state in the lateral and longitudinal directions" (*Hirosue* col. 8 lines 15-20 and Fig. 8). Clearly, *Hirosue* teaches that the random number is used to assign a location based on a distance from each of the four shots and the overlapped state in orthogonal directions, implying a center point where the axes cross, and not to provide a truly random placement for unit areas in a first region that are reflected in a single adjacent region identified with the phrase "each of the positions ... being opposite to those in the first shot", as claimed. While *Kim '256* teaches an equally numbered and ordered two-shot placement, *Hirosue* teaches an unequally numbered, multiple-shot placement that cannot be combined with the ordered teaching of *Kim '256*.

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In contrast to these cited references, independent claim 2 as amended includes "determining the positions or the sizes of the light-exposed unit areas or the light-blocked unit areas based on random numbers provided by a random number generator" and "each of the positions of the number of the light-blocked areas or the light-exposed areas in the second shot being opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform" which is neither taught nor fairly suggested by *Kim '256* and *Hirosue* in any combination. Further, independent claim 8 as amended includes "determining within each row or column the positions of said first number of light-exposed unit areas according to a set of random numbers, wherein each of the positions of the number of the light-exposed areas in the second shot are opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform" which is neither taught nor fairly suggested by *Kim '256* and *Hirosue* in any combination. So that independent claims 2 and 8 distinguish over *Kim '256* and *Hirosue*. Claims 4, 9, and 13 depend from either independent claim 2 or claim 8. Therefore, Applicants respectfully submit these claims are also patentably distinguished over *Kim '256* and *Hirosue* at least based on this dependence.

As discussed above, Applicants respectfully submit that the *Kim '256* and *Hirosue* references may not be combined as suggested, and even if combined they do not teach all the elements of the presently claimed invention. Therefore, Applicants respectfully request the rejection of claims 2, 4, 8, 9 and 13 under 35 U.S.C. 103(a) be withdrawn.

Claims 3, 11, and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim '256* in view of *Hirosue* and further in view of U.S. Patent No. 6,606,141 to *Takasugi et al.* (hereinafter *Takasugi*).

As discussed in reference to independent claim 2, *Kim '256* and *Hirosue* do not teach "determining the positions or the sizes of the light-exposed unit areas or the light-blocked unit

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areas based on random numbers provided by a random number generator" and "the positions

of the number of the light-blocked areas or the light-exposed areas in the second shot being

opposite to those in the first shot, the randomly positioned light-blocked areas and the light-

exposed areas having a distribution that is uniform", and *Takasugi* does not remedy this

deficiency. Since claim 3 depends from claim 2, Applicants respectfully submit that claim 3

also patentably distinguishes over *Kim '256*, *Hirosue*, and *Takasugi* at least based on this

dependence.

As discussed in reference to claim 8 above, *Kim '256* and *Hirosue* do not teach

"determining within each row or column the positions of said first number of light-exposed

unit areas according to a set of random numbers, wherein positions of the number of the light-

exposed areas in the second shot are opposite to those in the first shot, the randomly

positioned light-blocked areas and the light-exposed areas having a distribution that is

uniform" and *Takasugi* also does not remedy this deficiency. Since claims 11-12 depend

from claim 8, Applicants respectfully submit that claims 11-12 also patentably distinguish

over *Kim '256*, *Hirosue*, and *Takasugi* at least based on this dependence. Therefore,

Applicants respectfully request the rejection of claims 3, 11, and 12 under 35 U.S.C. 103(a)

be withdrawn.

Claims 5, 6, 8, 14 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable

over *Kim '256* in view of U.S. Patent No. 6,583,854 to *Hazama et al.* (hereinafter *Hazama*).

Hazama teaches a method of manufacture where pattern counterparts are made in a

"mutually complementary random interfitting relationship" (*Hazama* col. 3 lines 25-28) where

the random interfitting relationship is related to a linear (X or Y) pattern that lacks a

corresponding "opposite" as claimed, and discussed above in reference to claims 2 and 8

(*Hazama* col. 9 lines 23-45, col. 17 line 58 to col. 18 line 8, Figs. 1C-1F, and Fig. 8). Further,

Hazama discloses three color pixel units having division pattern elements arrayed "in random

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stepping-stone form" (*Hazama* col. 3 lines 43-52, col. 10 lines 49-53, and Figs. 2C-2F). *Hazama* discloses trend lines for various embodiments in Fig. 13, but Hazama nowhere discusses placement being based on a random number. Applicants respectfully assert that the term random is over-used in the literature, and unless the placement for each position is based upon a random number provided by a generator, then the placement cannot not be considered random in the same sense as claimed. Since *Hazama* does not teach random placement for exposed and unexposed regions having an opposite as described above, for at least this reason *Hazama* cannot be combined with *Kim '256* to teach all the claimed elements of the present invention. Further, *Kim '256* requires an ordered placement which teaches away from a combination with a random placement based on a random number, as discussed above.

Independent claim 5 as amended includes "determining the positions or the sizes of the light-exposed unit areas or the light-blocked unit areas by a random number generator, the number of the light-exposed unit areas or the light-blocked unit areas gradually decreasing or increasing along a direction from the first shot to the second shot, each of the positions of the number of the light-blocked areas or the light-exposed areas in the second shot being opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform" which is neither taught nor fairly suggested by *Kim '256* and *Hazama*, even if combined as suggested. Claim 6 depends from claim 5 and is distinguished over *Kim '256* and *Hazama* at least based on this dependence.

Similarly, independent claim 8 includes "determining within each row or column the positions of said first number of light-exposed unit areas according to a set of random numbers, wherein each of the positions of the number of the light-exposed areas in the second shot are opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform" which is neither taught nor fairly suggested by *Kim '256* and *Hazama* in any combination, even if combined as suggested.

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Claims 14-15 depend from claim 8 and patentably distinguish over *Kim '256* and *Hazama* at least based on this dependence. Therefore, Applicants respectfully request the rejection of claims 5, 6, 8, 14 and 15 under 35 U.S.C. 103(a) be withdrawn.

Claims 7 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim '256* in view of *Hazama* and further in view of U.S. Patent No. 6,100,953 to *Kim et al.* (hereinafter *Kim '953*).

Kim '953 does not teach random placement, and even if combined with *Kim '256* and *Hazama* as suggested, the combination does not teach "determining the positions or the sizes of the light-exposed unit areas or the light-blocked unit areas by a random number generator, the number of the light-exposed unit areas or the light-blocked unit areas gradually decreasing or increasing along a direction from the first shot to the second shot, each of the positions of the number of the light-blocked areas or the light-exposed areas in the second shot being opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform" as claimed, and *Kim '953* does not remedy this deficiency. Since claim 7 depends from claim 5, it patentably distinguishes over *Kim '256*, *Hazama*, and *Kim '953* at least based on this dependence.

Further, as discussed in reference to claim 8 above, *Kim '256* and *Hazama* do not teach "determining within each row or column the positions of said first number of light-exposed unit areas according to a set of random numbers, wherein each of the positions of the number of the light-exposed areas in the second shot are opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform" and *Kim '953* does not remedy this deficiency. Claim 16 depends from claim 8 and patentably distinguishes over *Kim '256*, *Hazama*, and *Kim '953* at least based on this dependence. Therefore, Applicants respectfully request the rejection of claims 7 and 16 under 35 U.S.C. 103(a) be withdrawn.

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Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim '256* in view of *Hirosue* and further in view of U.S. Patent No. 5,987,483 to *Edelkind et al.* (hereinafter *Edelkind*).

Edelkind teaches extracting a random number from naturally occurring events and exploiting directional randomness associated with radioactive decay (*Edelkind* col. 2 lines 33-43, col. 3 lines 25-44, col. 5 lines 42-47, and Figs 1-4). However, *Edelkind* does not include a teaching to combine with *Kim '256* and *Hirosue*, and even if combined as suggested, *Eledkind* cannot be combined to teach all of the presently claimed elements. Specifically, as discussed in reference to claim 8, *Kim '256* and *Hirosue* alone or in combination do not teach "determining within each row or column the positions of said first number of light-exposed unit areas according to a set of random numbers, wherein each of the positions of the number of the light-exposed areas in the second shot are opposite to those in the first shot, the randomly positioned light-blocked areas and the light-exposed areas having a distribution that is uniform", and *Edelkind* does not remedy this deficiency. Claim 10 depends from claim 8 and patentably distinguishes over *Kim '256*, *Hirosue*, and *Edelkind* at least based on this dependence. Therefore, Applicants respectfully request the rejection of claim 10 under 35 U.S.C. 103(a) be withdrawn.

In view of the above amendments and remarks, Applicants respectfully request the withdrawl of all rejections and timely issuance of a notice of allowance. If there are any questions, a telephone call to the undersigned is both welcomed and encouraged at telephone number (949)-752-7040.

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Respectfully submitted,

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